

WHAT IS CLAIMED IS:

1. A method of operating an information storage system which includes an information storage medium and structure operable to effect information transfers with respect to said information storage medium, comprising:

monitoring a characteristic of information read by said structure from said storage medium, including determining whether said characteristic satisfies a predetermined criteria; and

responding to a determination that said characteristic fails to satisfy said predetermined criteria by carrying out a course of action which includes a selected action that reduces the likelihood of non-recoverable errors in data read by said structure from said storage medium.

2. A method according to Claim 1, including:

using said structure to write selected data to said storage medium;

thereafter reading said selected data from said storage medium; and

then carrying out said monitoring of said characteristic based on said selected data as read back from said storage medium.

3. A method according to Claim 2, including selecting as said characteristic one of a soft error rate and a channel quality parameter.

4. A method according to Claim 3,
including selecting the soft error rate as said
characteristic; and

5 wherein said determining of whether said
characteristic satisfies a predetermined criteria
includes comparing said soft error rate to a value
selected as a function of a relationship of hard read
errors with respect to the soft error rate.

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5. A method according to Claim 1, wherein said
course of action includes:

reading further information from a different
location on said storage medium;

15 determining whether said characteristic satisfies
said predetermined criteria with respect to said further
information; and

20 responding to a determination that said
characteristic fails to satisfy said predetermined
criteria with respect to said further information by
taking action which includes said selected action.

25 6. A method according to Claim 1, wherein said
selected action includes one of inhibiting normal
operation of said information storage system, preventing
said structure from writing information to said storage
medium, preventing said structure from writing
information to said storage medium except in a write-
with-verify operation, and carrying out a recovery
30 procedure.

7. A method according to Claim 6,
wherein said selected action includes said carrying
out of said recovery procedure;

5 including configuring said structure to include a
head used to transfer information with respect to said
storage medium; and

wherein said recovery procedure includes performing
a cleaning operation with respect to said head.

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8. A method according to Claim 1, wherein said
monitoring of said characteristic is carried out in
response to a user request for a transfer of information
with respect to said storage medium, and prior to
15 carrying out said user request.

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9. A method according to Claim 1, wherein said
monitoring of said characteristic is carried out after
carrying out a user request for a transfer of information
with respect to said storage medium.

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10. A method according to Claim 1, wherein said
monitoring of said characteristic is carried out using
information read from said storage medium in response to
a user request for that information.

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11. A method according to Claim 1, wherein said
monitoring of said characteristic is carried out during
an idle state of said information storage system while
said information storage system is free of a user request
for a transfer of information with respect to said
storage medium.

12. A method of operating an information storage system which includes an information storage medium having an information storage surface with first and 5 second portions, and which includes structure operable to effect information transfers with respect to said first portion of said surface, said structure including a head which is movable relative to said surface, comprising:

10 moving said head from a first position spaced from said surface to a second position in which said head is adjacent

said second portion of said surface;

15 waiting a predetermined time interval while effecting relative movement of said head and said surface with said head adjacent said second portion of said surface; and

thereafter moving said head to a third position in which said head is adjacent said first portion of said surface.

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13. A method according to Claim 12, including after said waiting and before said moving of said head to said third position:

25 moving said head from said second position to a position spaced from said surface;

cleaning said head; and

then moving said head back to said second position.

14. A method according to Claim 12,
wherein said second portion of said information
storage surface stores predetermined control information;

5 including after said moving of said head to said
second position, and before said moving of said head to
said third position, evaluating a characteristic of the
control information read by said head from said second
portion of said surface to determine whether a distance
10 between said head and said surface is currently greater
than a selected value; and

15 responding to a determination that said distance is
greater than said selected value by moving said head from
said second position to a position spaced from said
surface, cleaning said head, and then moving said head
back to said second position.

15. A method according to Claim 14, wherein said
characteristic is a position error signal.

16. A method of operating an information storage system which includes an information storage medium having an information storage surface, and which includes 5 structure operable to effect information transfers with respect to said surface, said structure including a head which is movable relative to said surface, comprising:

calculating a distance of said head from said surface based on information read by said structure from 10 said surface; and

determining as a function of said distance whether one of said head and said storage medium is likely to fail to satisfy a predetermined operational criteria.

15 17. A method according to Claim 16,

wherein said information used for determining said distance is user data; and

20 responding to a determination that one of said head and said storage medium is likely to fail to satisfy the predetermined operational criteria by:

calculating a second distance of said head from said surface based on servo information read by said structure from said surface; and

25 determining as a function of said second distance whether one of said head and said storage medium is likely to fail to satisfy a predetermined operational criteria.

18. A method according to Claim 17, including responding to a determination based on said second distance that said head and said storage medium are likely to satisfy the predetermined operational criteria by:

rewriting the user data to said storage medium at the same location from which it was read;

reading said rewritten user data back from said storage medium;

calculating a third distance of said head from said surface based on said rewritten user data read back from said storage medium; and

determining as a function of said third distance whether one of said head and said storage medium is likely to fail to satisfy a predetermined operational criteria.

19. A method according to Claim 18, including responding to a determination based on said rewritten user data read back from said storage medium that one of said head and said storage medium is likely to fail to satisfy the predetermined operational criteria by:

moving the user data to a different location on said storage medium.

20. A method according to Claim 17, including responding to a determination based on said second distance that said head and said storage medium are likely to satisfy the predetermined operational criteria by:

moving said head to a different position relative to said storage medium;

calculating a third distance of said head from said surface based on servo information read by said structure from said surface at said different position; and

determining as a function of said third distance whether one of said head and said storage medium is likely to fail to satisfy a predetermined operational criteria.

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21. A method according to Claim 20, including responding to a determination based on said third distance that said head and said storage medium are likely to satisfy the predetermined operational criteria by:

moving the user data to a different location on said storage medium.

22. A method according to Claim 20, including responding to a determination based on said third distance that one of said head and said storage medium is likely to fail to satisfy the predetermined operational criteria by:

5 moving said head to a reserved portion of said storage medium;

writing selected information to said storage medium;

10 reading said selected information back from said storage medium;

calculating a fourth distance of said head from said surface based on said selected information read back from said storage medium; and

15 determining as a function of said fourth distance whether one of said head and said storage medium is likely to fail to satisfy a predetermined operational criteria.

20 23. A method according to Claim 22, including responding to a determination with respect to said fourth distance that said head and said storage medium are likely to satisfy the predetermined operational criteria by:

25 providing an indication that the storage medium should be replaced.

24. A method according to Claim 22, including responding to a determination with respect to said fourth distance that one of said head and said storage medium is likely to fail to satisfy the predetermined operational criteria by:

requesting that said storage medium be replaced with a replacement storage medium;

calculating a fifth distance of said head from said surface of said replacement storage medium based on information read by said structure from a surface of the replacement storage medium; and

determining as a function of said fifth distance whether one of said head and said storage medium is likely to fail to satisfy a predetermined operational criteria.

25. A method according to Claim 24, including responding to a determination with respect to said fifth distance that one of said head and said storage medium is likely to fail to satisfy the predetermined operational criteria by providing an indication that said structure should be replaced.

26. An apparatus comprising an information storage system which includes:

an information storage medium;

5 structure operable to effect information transfers with respect to said information storage medium; and

a control portion operable to:

monitor a characteristic of information read by said structure from said storage medium and to determine 10 whether said characteristic satisfies a predetermined criteria; and

respond to a determination that said characteristic fails to satisfy said predetermined criteria by carrying 15 out a course of action which includes a selected action that reduces the likelihood of non-recoverable errors in data read by said structure from said storage medium.

27. An apparatus according to Claim 26, wherein said control portion is further operable to:

20 use said structure to write selected data to said storage medium;

thereafter read said selected data from said storage medium; and

25 then carry out said monitoring of said characteristic based on said selected data as read back from said storage medium.

28. An apparatus according to Claim 27, wherein 30 said characteristic is one of a soft error rate and a channel quality parameter.

29. An apparatus according to Claim 26, wherein said control portion is operable to effect said course of action by:

5 reading further information from a different location on said storage medium;

determining whether said characteristic satisfies said predetermined criteria with respect to said further information; and

10 responding to a determination that said characteristic fails to satisfy said predetermined criteria with respect to said further information by taking action which includes said selected action.

30. An apparatus according to Claim 26, wherein 15 said selected action includes one of inhibiting normal operation of said information storage system, preventing said structure from writing information to said storage medium, preventing said structure from writing information to said storage medium except in a write- 20 with-verify operation, and carrying out a recovery procedure.

31. An apparatus according to Claim 30, 25 wherein said structure includes a head used to transfer information with respect to said storage medium; wherein said selected action is carrying out said recovery procedure; and

30 wherein said control portion is operable to carry said recovery procedure in a manner which includes performing a cleaning operation with respect to said head.

32. An apparatus comprising an information storage system which includes:

an information storage medium having an information storage surface with first and second portions;

structure operable to effect information transfers with respect to said first portion of said surface, said structure including a head which is movable relative to said surface; and a control portion operable to:

move said head from a first position spaced from said surface to a second position in which said head is adjacent

said second portion of said surface;

wait a predetermined time interval while effecting relative movement of said head and said surface with said head adjacent said second portion of said surface; and

thereafter move said head to a third position in which said head is adjacent said first portion of said surface.

33. An apparatus according to Claim 32, wherein said control portion is further operable, after said wait and before said moving said head to said third position, to:

move said head from said second position to a position spaced from said surface;

clean said head; and

then move said head back to said second position.

34. An apparatus according to Claim 32,
wherein said second portion of said information
storage surface stores predetermined control information;
5 and

wherein said control portion is further operable,
after moving said head to said second position and before
moving said head to said third position, to:

10 evaluate a characteristic of the control information
read by said head from said second portion of said
surface to determine whether a distance between said head
and said surface is currently greater than a selected
value; and

15 respond to a determination that said distance is
greater than said selected value by moving said head from
said second position to a position spaced from said
surface, cleaning said head, and then moving said head
back to said second position.

20 35. An apparatus according to Claim 34, wherein
said characteristic is a position error signal.

36. An apparatus comprising an information storage system which includes: ✓

5 an information storage medium having an information storage surface;

structure operable to effect information transfers with respect to said surface, said structure including a head which is movable relative to said surface; and
a control portion operable to:

10 calculate a distance of said head from said surface based on information read by said structure from said surface; and

15 determine as a function of said distance whether one of said head and said storage medium is likely to fail to satisfy a predetermined operational criteria.

37. An apparatus according to Claim 36,
wherein said information used for determining said distance is user data; and

20 wherein said control portion is operable in response to a determination that one of said head and said storage medium is likely to fail to satisfy the predetermined operational criteria to:

25 calculate a second distance of said head from said surface based on servo information read by said structure from said surface; and

30 determine as a function of said second distance whether one of said head and said storage medium is likely to fail to satisfy a predetermined operational criteria.

38. An apparatus according to Claim 37, wherein
said control portion is operable in response to a
determination based on said second distance that said
head and said storage medium are likely to satisfy the
5 predetermined operational criteria to:

rewrite the user data to said storage medium at the
same location from which it was read;

read said rewritten user data back from said storage
medium;

10 calculate a third distance of said head from said
surface based on said rewritten user data read back from
said storage medium; and

15 determine as a function of said third distance
whether one of said head and said storage medium is
likely to fail to satisfy a predetermined operational
criteria.

39. An apparatus according to Claim 38, wherein
said control portion is operable in response to a
20 determination based on said rewritten user data read back
from said storage medium that one of said head and said
storage medium is likely to fail to satisfy the
predetermined operational criteria to move the user data
to a different location on said storage medium.

40. An apparatus according to Claim 37, wherein
said control portion is operable in response to a
determination based on said second distance that said
head and said storage medium are likely to satisfy the
5 predetermined operational criteria to:

move said head to a different position relative to
said storage medium;

10 calculate a third distance of said head from said
surface based on servo information read by said structure
from said surface at said different position; and

determine as a function of said third distance
whether one of said head and said storage medium is
likely to fail to satisfy a predetermined operational
criteria.

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41. An apparatus according to Claim 40, wherein
said control portion is operable in response to a
determination based on said third distance that said head
and said storage medium are likely to satisfy the
20 predetermined operational criteria to move the user data
to a different location on said storage medium.

42. An apparatus according to Claim 40, wherein
said control portion is operable in response to a
determination based on said third distance that one of
said head and said storage medium is likely to fail to
5 satisfy the predetermined operational criteria to:

move said head to a reserved portion of said storage
medium;

write selected information to said storage medium;

10 read said selected information back from said
storage medium;

calculate a fourth distance of said head from said
surface based on said selected information read back from
said storage medium; and

15 determine as a function of said fourth distance
whether one of said head and said storage medium is
likely to fail to satisfy a predetermined operational
criteria.

43. An apparatus according to Claim 42, wherein
20 said control portion is operable in response to a
determination with respect to said fourth distance that
said head and said storage medium are likely to satisfy
the predetermined operational criteria to provide an
indication that the storage medium should be replaced.

44. An apparatus according to Claim 42, wherein
said control portion is operable in response to a
determination with respect to said fourth distance that
5 one of said head and said storage medium is likely to
fail to satisfy the predetermined operational criteria
to:

request that said storage medium be replaced with a
replacement storage medium;

10 calculate a fifth distance of said head from said
surface of said replacement storage medium based on
information read by said structure from a surface of the
replacement storage medium; and

15 determine as a function of said fifth distance
whether one of said head and said storage medium is
likely to fail to satisfy a predetermined operational
criteria.

45. An apparatus according to Claim 44, wherein
20 said control portion is operable in response to a
determination with respect to said fifth distance that
one of said head and said storage medium is likely to
fail to satisfy the predetermined operational criteria to
provide an indication that said structure should be
25 replaced.